10CFR50.73

Virginia Electric and Power Company
North Anna Power Station
P. O. Box 402
Mineral, Virginia 23117

December 12, 2012

Attention: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Serial No.: 12-681
NAPS: MPW
Docket No.: 50-339
License No.: NPF-7

Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Power Station Unit 2.

Report No. 50-339/2012-001-00

This report has been reviewed by the Facility Safety Review Committee and will be forwarded to the Management Safety Review Committee for its review.

Sincerely,

Gerald T. Bischof
Site Vice President
North Anna Power Station

Enclosure

Commitments contained in this letter: None

cc: United States Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

NRC Senior Resident Inspector
North Anna Power Station

IE22
NRR

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES: 10/31/2013
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)	Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE
Automatic Reactor Trip Due To Turbine Trip Resulting From A Card Failure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCUMENT NUMBER **05000**
10	24	2012	2012	-- 001 --	00	12	12	2012	FACILITY NAME	DOCUMENT NUMBER **05000**

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (*Check all that apply*)			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
100	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (*Include Area Code*)
R. M, Garver, Director Station Safety and Licensing	(540) 894-2108

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
A	TG	CAP	W120	Y						

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES (*If yes, complete 15. EXPECTED SUBMISSION DATE*) ☒ NO				

ABSTRACT (*Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines*)

On October 24, 2012, at 0147 hours with Unit 2 in Mode 1, 100 percent power, an automatic reactor trip occurred due to a low-low level in the “C” steam generator (SG) resulting from closure of all four governor valves. The governor valves’ closed due to a spurious error signal from Speed Error Amplifier Card “B” (1A08D). The card malfunction was the result of a failed capacitor. All systems responded as expected. All control rods inserted into the core at the time of the trip and decay heat was removed via the main condenser steam dumps. The auxiliary feedwater (AFW) pumps received an automatic start signal due to low-low level in “C” SG at the time of the trip. The SG levels were restored to normal operating level. At 0240 hours, a 1 hour report was made to the NRC as an After-The-Fact Unusual Event due to a pressurizer relief valve opening momentarily exceeding EAL SU6.1, Reactor Coolant System Leakage. The emergency notification was subsequently retracted. At 0318 hours, a 4 hour report was made in accordance with 10CFR50.72(b)(2)(iv)(B) for Reactor Protection System (RPS) actuation and 8 hour report in accordance with 10CFR50.72(b)(3)(iv)(A) for AFW pump automatic start. This event is reportable per 10 CFR 50.73(a)(2)(iv)(A) for a condition that resulted in automatic actuation of the RPS and AFW System. The health and safety of the public were not affected by the event.

NARRATIVE

1.0 DESCRIPTION OF THE EVENT

On October 24, 2012, at 0147 hours with Unit 2 in Mode 1, 100 percent power, an automatic reactor trip occurred due to a low-low level in the "C" steam generator (SG) (EIIS System AB, Component SG) resulting from closure of all four governor valves. Closure of all four governor valves (EIIS System TA, Component V) resulted in a loss of load. The governor valves' closure was caused by a spurious speed error signal from the Speed Error Amplifier Card "B" (1A08D) in the Electro-Hydraulic Fluid Control System (EHC) (EIIS System TG, Component IMOD).

All systems responded as expected. All control rods (EIIS System AA, Component ROD) inserted into the core at the time of the trip and decay heat was removed via the main condenser steam dumps (EIIS System SG, Component RV). The Auxiliary Feedwater (AFW) pumps (EIIS System BA, Component P) received an automatic start signal due to low-low level in the "C" SG at the time of the trip, SG levels were restored to normal operating level. The AFW System operated as designed with no abnormalities noted.

The Unit 2 Pressurizer Power Operated Relief Valve (PORV), 2-RC-PCV-2455C (EIIS System AB, Component RV), opened momentarily during the automatic reactor trip. The valve indicated open for less than 1 second. The PORV reseated and remained available for automatic operation if needed with no ongoing leakage occurring during the transient. The transient was characterized as uncomplicated.

At 0240 hours, a 1 hour report was made to the NRC as an After-The-Fact Unusual Event due to 2-RC-PCV-2455C opening momentarily exceeding EAL SU6.1. Subsequent review determined that 2-RC-PCV-2455C functioned as designed and therefore did not meet the criteria for an Unusual Event and the notification was retracted.

At 0318 hours, a 4 hour report was made to the NRC in accordance with (IAW) 10CFR50.72(b)(2)(iv)(B) for Reactor Protection System (RPS) (EIIS System JC) actuation and 8 hour report IAW 10CFR50.72(b)(3)(iv)(A) for AFW system actuation.

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

No significant safety consequences resulted from this event since the RPS and the Engineered Safety Feature System (ESF) equipment responded as designed. Steam Generator levels were restored to normal operating level. As such, the event posed no significant safety implications and the health and safety of the public were not affected by the event.

The event is being reported pursuant to 10CFR50.73(a)(2)(iv) for an event that resulted in automatic actuation of the RPS and AFW System.

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3.0 CAUSE

The direct cause of this event was a failure of the C4 capacitor (EIIS Component CAP) on the Speed Error Amplifier Card B (1A08D). When this capacitor shorted, the -15 VDC power was lost to the Operational Amplifier and this caused the Operational Amplifier to output a spurious high voltage signal to the Governor valves.

The root cause determined the evaluation of capacitor replacement frequency performed in 2002 did not use the most conservative recommendation of the card manufacturer. The evaluation did not consider the sub-component capacitor manufacturer's recommendation. During the 2002 evaluation the card replacement recommendation from the Electro-Hydraulic Fluid Control System (EHC) Original Equipment Manufacturer (OEM) was thought to be adequate information to establish the replacement frequency of a sub-component on that card. The capacitor replacement recommendation of 10 - 20 years by the OEM was viewed as the governing standard. Benchmarking, Operating Experience (OE) and plant conditions were also used for determining replacement of the component within that band. The replacement frequency of eight (8) refueling outages (12 years) was at the low end of the OEM specified band and was typical when compared to the industry.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

The Control Room crew responded to the reactor trip in accordance with emergency procedure 2-E-0, Reactor Trip or Safety Injection. The post trip response progressed as expected and the Control Room crew transitioned to 2-ES-0.1, Reactor Trip Response. All equipment responded as designed. By 0403 hours, Unit 2 exited 2-ES-0.1 and entered 2-OP-1.5, Unit Startup from Mode 3 to Mode 2.

5.0 ADDITIONAL CORRECTIVE ACTIONS

The EHC Speed Error Amplifier Card B (1A08D) was replaced and tested satisfactorily. The problem with 1A08D was able to be duplicated on other Speed Error Amplifier Cards removed from the Unit 2 EHC cabinet. The speed error signal was able to be duplicated to greater than 13 VDC with the 1A08D card installed.

6.0 ACTIONS TO PREVENT RECURRENCE

The preventive maintenance (PM) task basis procedure is being revised to ensure that component level replacement recommendations are obtained from component manufacturer guidance. Lessons learned from the root cause and the revision to PM will be added to the Engineering Training Program. The capacitor replacement frequency PM will be revised to align with vendor guidance. Additionally, single point vulnerabilities are being reviewed to ensure that capacitor sub-components have the appropriate replacement frequencies established.

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7.0 SIMILAR EVENTS

LER 50-339-2001-005-00, dated 2/15/2005, documented an automatic reactor trip due to a failure in the EHC power supply system. Governor valves closed causing a loss of load and subsequent low-low level in the “A” SG.

8.0 ADDITIONAL INFORMATION

Unit 1 was operating in Mode 1, 100 percent power on October 24, 2012 and was not affected by this event.

Description: Speed Error Amplifier Card
Manufacturer: Westinghouse
Model No.: 1A08D

Description: Capacitor
Manufacturer: Sprague
Model No.: C4